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and Kelly M. Babchishin²**

Abstract

There is much concern about the likelihood that online sexual offenders (particularly online child pornography offenders) have either committed or will commit offline sexual offenses involving contact with a victim. This study addresses this question in two meta-analyses: the first examined the contact sexual offense histories of online offenders, whereas the second examined the recidivism rates from follow-up studies of online offenders. The first meta-analysis found that approximately 1 in 8 online offenders (12%) have an officially known contact sexual offense history at the time of their index offense ($k = 21$, $N = 4,464$). Approximately one in two (55%) online offenders admitted to a contact sexual offense in the six studies that had self-report data ($N = 523$). The second meta-analysis revealed that 4.6% of online offenders committed a new sexual offense of some kind during a 1.5- to 6-year follow-up ($k = 9$, $N = 2,630$); 2.0% committed a contact sexual offense and 3.4% committed a new child pornography offense. The results of these two quantitative reviews suggest that there may be a distinct subgroup of online-only offenders who pose relatively low risk of committing contact sexual offenses in the future.

Keywords

online offending, child pornography, luring, contact sexual offending, recidivism, meta-analysis

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There has been increasing attention to the problem of online sexual offending,¹ particularly the use of Internet and related digital technologies to obtain, distribute, or produce child pornography, or to contact potential child victims to create opportunities for sexual offending (e.g., attempting to arrange a meeting with a minor met online, for sexual purposes). There has been a particular focus on child pornography offending, which involves child exploitation and can increase the incidence of contact sexual offending by increasing demand for new content and thereby increasing the production of such images. Though they continue to represent only a small proportion of total child exploitation crimes, the number of arrests for online sexual offenses has increased greatly in the past 10 years (Bates & Metcalf, 2007; Motivans & Kyckelhan, 2007; Wolak, Finkelhor, & Mitchell, 2005, 2009).

There is specific public and professional concern about the likelihood that online offenders also commit contact sexual offenses offline (e.g., Lam, Mitchell, & Seto, 2010). There are two forms of this question: (a) What is the likelihood that an online offender has a history of offline sexual offending? (b) What is the likelihood that an online offender will go on to commit an offline sexual offense in the future? In this article, we report meta-analyses addressing each of these questions. The results of these two quantitative reviews are relevant for risk assessment and management because, for the first question, a high degree of overlap suggests risk assessment measures developed with offline sexual offenders are also likely to be valid. This is clearly so for online offenders who already have a known contact sexual offense history, and is likely to be true for online sexual offenders if they are similar to offline sexual offenders in crime-related characteristics (see Babchishin, Hanson, & Hermann, *in press*). For the second question, information about the recidivism rates of online offenders can help guide policy and practice decisions; for example, high recidivism rates might suggest that more intensive (and expensive) responses are warranted, whereas low recidivism rates suggest that other, higher risk populations of sexual offenders are a higher priority for law enforcement and other social responses.

Criminal History

We identified 24 studies that reported on the criminal histories of online offenders. Many of these studies report that the majority of online offenders have no prior contact sexual offense history, and in fact many online offenders have no prior criminal history of any kind. There is, however, substantial variation in the reported rates. Lower prevalence estimates tend to be obtained in samples of arrested suspects (Seto & Eke, 2008; Wolak et al., 2005), with somewhat higher estimates for correctional or criminal justice samples, and the highest estimates for clinically referred samples (Buschman & Bogaerts, 2009; Seto, Cantor, & Blanchard, 2006). This trend is probably the result of contact offense history having an effect on whether someone is incarcerated and a larger effect on being referred for assessment or treatment.

Consistent with criminological research on the ratios of detected compared with undetected criminal activity, a higher proportion of online offenders had a contact

sexual offense history when self-report was available. Of particular note is the study by Bourke and Hernandez (2009), which found that many online offenders who had no official history of contact sexual offenses subsequently admitted to such crimes after participating in treatment and, in some cases, undergoing polygraph examinations. Approximately a quarter (24%) of the sample had an officially known contact sexual offense history at the time they were initially assessed, but a large majority (85%) of the sample had such a history after participating in treatment and reporting previously unknown offenses. This finding has been used in criminal proceedings to support longer sentences and/or more restrictive treatment and supervision conditions for online offenders (Gelber, 2009; Hansen, 2009). At the same time, this study has been criticized because of potential selection effects to enter the federal treatment program and the possibility that offenders had strong incentives to admit to sexual contacts, even if untrue, as a sign of their progress in treatment (*Johnson v. United States of America*, 2008). It is not controversial that some online offenders have committed contact sexual offenses that were not reported to police, as is true for many other kinds of crimes.

Online Offender Recidivism

We found nine studies that reported the recidivism rates of online offenders. Many of these studies are as yet unpublished, reflecting the newness of this line of research. These recidivism studies have generally had short follow-up periods, especially when compared to the longer running follow-up studies of offline offenders, which in some cases provide recidivism estimates after 20 to 30 years at risk (see Hanson & Morton-Bourgon, 2005). Nonetheless, given the caveats that the follow-up times are short and such studies have relied on official criminal records that underestimate reoffending, the recidivism rates appear to be quite low.

Present Study

We conducted two meta-analyses, one examining the criminal histories of online offenders, and the second examining the recidivism rates of online offenders. The purpose of these meta-analyses was to estimate the extent of offline sexual offending among offenders identified by online offenses, both historically and prospectively.

Method

Selection of Studies

Computer searches of electronic databases—Digital Dissertations and Theses, National Criminal Justice Reference System (NCJRS), PsycINFO, PubMed, Scholars Portal, and the Web of Science—were conducted using the following key terms: internet sex* offend*, internet child molest*, child abuse imag*, imag* of child abuse,

online offend*, child porn*, past, previous, prior, offend*, recid*, reoffen*, charge, convict*, arrest, and self-report. Additional studies were found through the reference lists of the collected articles, review articles in this area, contacting researchers who study Internet sexual offenders, and a request for information about such studies posted in July, 2009, on the e-mail list for members of the Association for the Treatment of Sexual Abusers.

Meta-analysis of prior contact sex offenses among online sexual offenders. To be included in the meta-analysis of prior contact sex offenses, a study had to include an identifiable sample of online sexual offenders and report on the history of sexual offending of the group using either official records or self-report. Recent samples (post-2000) of "child pornography" offenders were included because we presumed that a large majority of these offenders would have used the Internet and related digital technologies in committing their offenses. For example, only 4.5% of Faust, Renaud, and Bickart's (2009) sample of child pornography offenders had not used the Internet to commit their index crimes. In all, 24 samples with relevant data were identified (see Table 1), of which 18 used official records (i.e., arrests, charges, and/or convictions), 3 used self-report, and 3 reported both indices of criminal history.

Meta-analysis of online sexual offenders and recidivism. To be included in the meta-analysis of recidivism rates of online sexual offenders, a study had to report on sexual or violent recidivism among an independent group of online sexual offenders (see Table 2). We identified nine samples, all of which reported an overall sexual recidivism rate. As well, seven samples reported separately the rates of contact sexual offenses and child pornography offenses. Five samples reported the rates of violent recidivism, comprising both nonsexually violent and contact sexual offenses. Violent recidivism was included because many apparently nonsexually violent charges against adjudicated sexual offenders are, in fact, sexually motivated when examined in detail (Rice, Harris, Lang, & Cormier, 2006). Furthermore, the public, practitioners, and policy makers are concerned about all violence, not just sexual crimes. Recidivism information was based on official criminal records in all of the samples.

Aggregation of Findings

The basic effect size indicator was p , which indexed either the proportion of online sexual offenders who had committed contact sexual offenses, or the proportion of recidivists in the follow-up sample. Using a standard formula, the variance of p is estimated as $[(p(1 - p))/n]$ (Fleiss, Levin, & Paik, 2003, sec. 2.4). Although raw proportions are easily interpreted, they are not optimal for meta-analyses involving low frequency events. The variance of p is small in two quite different circumstances: (a) when the sample size is very large and (b) when there are no recidivists as a result of small samples, short follow-up times, or low base rates of reoffending. As well, the standard approach assumes that the variance decreases as the proportions approach zero, which has the effect of giving the most weight to studies with the smallest recidivism rates.

Table 1. Studies Examining Contact Sexual Offenses Among Online Sexual Offenders

Study	Sample Description	N	Percentage With Contact Offenses (n)	Source
1. Abondo, Bouvet, and Le Gueut (2009)	Online offenders from France, data collected using police, court, and psychology files	39	7.7 (3)	Charges
2. Baartz (2008)	Online offenders from Australia, investigated between 2005 and 2006	50	4.0 (2)	Convictions
3. Bourke and Hernandez (2009) ^e	Sex offender treatment program at a medium-security federal prison in the United States	155 155	84.5 (131) 12.9 (20)	Self-reports Convictions
4. Buschman and Bogaerts (2009) ^{ae}	Convicted internet sexual offenders who volunteered for the study (used polygraph)	38 63	55.3 (21) 0.0 (0)	Self-reports Prior arrests
5. Coward, Gabriel, Schuler, and Prentky (2009)	Offenders charged or arrested for an internet sexual offense	128	32.8 (42)	Self-reports
6. Eke and Seto (2009) ^b	Persons listed on the Ontario Sex Offender Registry who were convicted for a child pornography offense and subsequently released into the community	324	22.5 (73)	Charges
7. Elliott, Beech, Mandeville-Norden, and Hayes (2009)	U.K. Probation Service, assessed for suitability of treatment	494	10.9 (54)	Convictions
8. Endrass et al. (2009)	Swiss men from Operation Landslide	231	0.9 (2)	Convictions
9. Faust et al. (2009)	Offenders in federal prisons in the United States	870	9.4 (82)	Convictions
10. Fortin and Roy (2007)	Online offenders from Quebec arrested between 1998 and 2004 (includes 13.6% offenders aged between 10 and 18 years)	192	10.4 (20)	Charges
11. Galbreath, Berlin, and Sawyer (2002)	Men assessed in an outpatient clinic because of concerns about their Internet use	39	7.7 (3)	Charges

(continued)

Table 1. (continued)

Study	Sample Description	N	Percentage With Contact Offenses (n)	Source
12. Laulik, Allam, and Sheridan (2007)	Internet sexual offenders in a mandatory community-based treatment center	30	6.7 (2)	Convictions
13. McLaughlin (2000)	Internet sexual offenders arrested during an internal law enforcement project conducted by the U.S. Keene Police Department between 1997 and 2000	200	12.0 (24)	Arrests
14. Neutze, Seto, Schaefer, Mundt, and Beier (in press)	German community sample of self-identified pedophiles and hebephiles	108	57.4 (62)	Self-reports
15. Quayle and Taylor (2003)	Data derived from COPINE project in the United Kingdom	23	47.8 (11)	Self-reports
16. Seto et al. (2006)	Child pornography offenders referred for a sexological assessment in Canada	100	43.0 (43)	Charges
17. Seto and Eke (2008)	Convicted Internet offenders in Canada; data collected using police investigation files	301	5.0 (15)	Charges
18. Seto, Reeves, and Jung (2010) ^c	Outpatient clinic that provided community-based assessment and treatment for forensic patients	34	11.8 (4)	Charges
19. Sullivan (2007) ^d	Convicted Internet sexual offenders from New Zealand	215	13.0 (28)	Convictions
20. Webb, Craissati, and Keen (2007)	Internet sexual offenders within the London Probation Area	90	14.4 (13)	Charges
21. Wolak et al. (2005)	All men arrested for a child pornography offense between July 2000 and July 2001 in the United States	420	11.2 (47)	Arrests
22. Wolak et al. (2009)	All men arrested for a child pornography offenses in the calendar year 2006 in the United States	473	20.9 (99)	Arrests

(continued)

Table 1. (continued)

Study	Sample Description	N	Percentage With Contact Offenses (n)	Source
23. Wollert, Waggoner, and Smith (2009)	Offenders in an outpatient treatment program in the United States	72	13.9 (10)	Convictions
24. Wood, Seto, Flynn, Wilson-Cotton, and Dedmon (2009) ^e	Registered male sexual offenders in the United States assessed at the Arkansas Sex Offender Screening and Risk Assessment program (used polygraph)	72 71	0.0 (0) 32.3 (21)	Charges Self-reports

Note: The registered sex offender sample reported by Seto and Eke (2005) is subsumed by the samples reported by Eke and Seto (2009) and by Seto and Eke (2008).

a. Numbers fluctuate because only 38 participants completed the self-report measure, whereas prior sexual offenses were reported for all participants.

b. Excluding offenders who were also included in the Seto and Eke (2008) police case sample; thus, there is no overlap between these two samples.

c. This study included 50 offenders interviewed by investigators of the Toronto Police Service. Given the time frame of data collection, it was likely that many of these offenders were already included in the studies reported by Eke and Seto (2009) or by Seto and Eke (2008), and so they are not reported here.

d. Includes nine offenders not charged for child pornography but charged for other illegal pornography.

e. Self-report data used in overall analysis, $N = 4,697$.

Given the problems with analyzing raw proportions from studies with low base rates, variance stabilization transformations are recommended (Cohen, 1988; Eisenhart, 1947; Fleiss et al., 2003). The most common variance stabilization transformation for proportions is the arcsine transformation, which we will denote by \check{A} , defined as $\check{A} = 2\arcsin\sqrt{P}$, with a variance of $1/n$. In other words, the variance of \check{A} depends only on the sample size, and not the size of the proportion.

For the prior criminal history meta-analysis, the analyses were conducted using both the raw proportions and the transformed proportions. Given the very small percentages in the recidivism meta-analysis, only the results for the transformed proportions were reported. All results were reported as proportions, however, because \check{A} in its original units (radians) is not easily interpreted. To analyze studies in which there were no recidivists for certain outcome categories, the recidivism rate (p) was estimated as $1/4n$ (i.e., Bartlett's adjustment, see Eisenhart, 1947, sec. 4.3; Cohen, 1988, p. 183).

The magnitude and consistency of the proportions were calculated using both fixed-effect and random-effects models (Hedges & Vevea, 1998). Each approach asks slightly different questions and neither approach has won universal acceptance (Whitehead, 2002, sec. 6.3). On a conceptual level, the conclusions of the fixed-effect

Table 2. Recidivism Rates of Online Sexual Offenders

Sample	N	Mean Follow-Up (Years)	Type of Recidivism in Percentage (n)			
			Any Sexual Offense	Contact Sexual	Child Pornography	Violent
1. Barnett, Wakeling, and Howard (in press); U.K. offenders	513	2.0	1.4 (7)	NA	NA	NA
2. Eke and Seto (2009); Ontario Sex Offender Registry sample ^a	324	4.3	8.0 (26)	4.0 (14)	5.3 (17)	6.5 (21)
3. Endrass et al. (2009); Swiss men from Operation Landslide	231	6.0	2.6 (6)	0.0 (0)	2.6 (6)	0.43 (1)
4. Faust et al. (2009); offenders in federal prisons in the United States	870	3.8	5.7 (50)	NA	NA	NA
5. Fortin and Roy (2007); adolescent and adult males in Quebec	192	2.0	0.0 (0)	0.0 (0)	0.0 (0)	NA
6. Osborn, Elliott, Middleton, and Beech (2009); adult men on probation in the United Kingdom	73	1.5-4.0	0.0 (0)	0.0 (0)	0.0 (0)	0.0 (0)
7. Seto and Eke (2008); police case file sample ^b	282	3.5	10.3 (29)	3.9 (11)	6.0 (17)	6.6 (19)
8. Webb et al. (2007); offenders on probation in the United Kingdom	73	1.5	2.7 (2)	0.0 (0)	2.7 (2)	0.0 (0)
9. Wollert et al. (2009); offenders in an outpatient treatment program in the United States	72	4.0	1.4 (1)	0.0 (0)	1.4 (1)	NA

Note: NA = not applicable. All studies used official criminal records to assess outcomes. Only the range of follow-up times was reported by Osborn et al. (2009). Violent offenses include both nonsexually violent and contact sexual offenses.

a. Sample does not overlap at all with sample reported by Seto and Eke (2008).

b. A total of 19 individuals from this sample of 301 offenders were not yet at risk in the community.

analyses are restricted to the particular set of studies included in the meta-analysis. In contrast, the random-effects model aims for conclusions that apply to the population of studies of which the current sample of studies is a part. In practical terms, the random-effects model includes an additional between-study error term (a constant) representing the unexplained variation across studies. Compared with the fixed-effect model, the random-effects model has higher variance estimates (wider confidence intervals), and the differences in sample size across the studies are given less importance. Consequently, the random-effects model gives relatively more weight to small studies than does the fixed-effect model, approximating unweighted averages.

When the statistical assumptions are violated, the fixed-effect model is too liberal and the random-effects model is too conservative (Overton, 1998). The results of the random-effects and fixed-effect models converge as the amount of between-study variability decreases. When the variation between studies is less than would be expected by chance ($Q < \text{degrees of freedom}$, using Cochran's Q statistic; Hedges & Olkin, 1985), the two approaches yield identical results. To test the generalizability of fixed-effects

across studies, the Q statistic was used, $Q = \sum_{i=1}^k w_i (p_i - p.)^2$, where p_i is the observed

proportion in each of k studies, and $p.$ is the weighted average. The Q statistic is distributed as χ^2 with $k - 1$ degrees of freedom (k is the number of studies).

A significant Q statistic indicates there is more variability across studies than would be expected by chance. If the Q statistic was significant, further examinations of the data were conducted to establish whether an outlier could be identified. A sample was considered to be an outlier if (a) it was an extreme value (highest or lowest), (b) the Q statistic was significant, and (c) the single finding accounted for more than 50% of the value of the Q statistic. When an outlier was detected, the results are reported with and without the exceptional sample.

Fixed-effect estimates of recidivism rates were calculated using the formula and procedures presented in Hedges (1994). Random-effects estimates were calculated using Formulae 10, 12, and 14 from Hedges and Vevea (1998). Hand calculations or SPSS syntax were used for all analyses, except for the random-effects meta-regression, which was computed using Comprehensive Meta-Analysis Version 2.0 (Biostat; Borenstein, Hedges, Higgins, & Rothstein, 2005). Both fixed-effect and random-effects models were estimated for both the raw proportions (p) and the transformed proportions (\tilde{A}).

Results

Prior Contact Sexual Offense History

Of the total combined sample of 4,697 online offenders, 17.3% ($n = 812$) were known to have committed a contact sexual offense, mostly against a child. As expected, samples using official data had lower rates of prior sexual offenses than those using self-reported offense histories. Official records were available for 4,464 online sexual offenders. Of these, 12.2% ($n = 544$) had prior contact sex offenses.

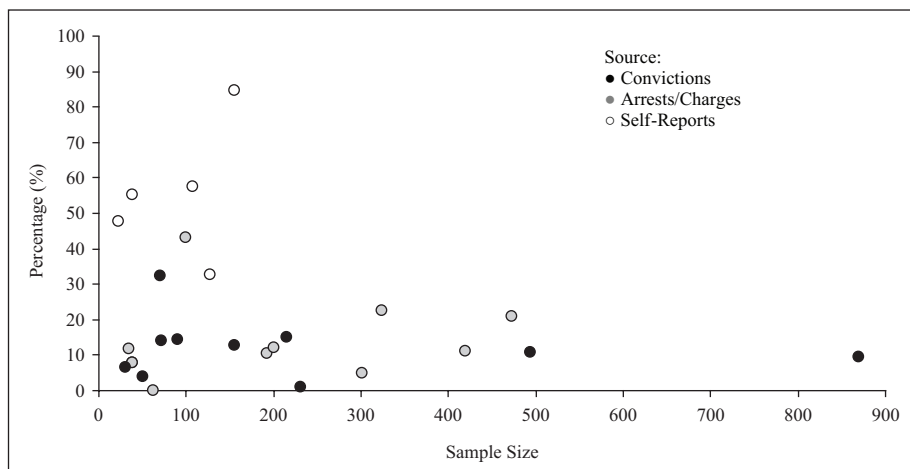


Figure 1. Percentage of prior contact sex offenses per study

In contrast, of the 523 online sexual offenders with self-reported offense history information, 55.1% ($n = 288$) disclosed prior sexual contact with children. Figure 1 presents the rates of prior contact sexual offenses by source of information (i.e., convictions, arrests/charges, or self-report).

The fixed-effect meta-analyses found considerably more variability than would be expected by chance for both the raw proportions ($Q = 1,207.71$, $df = 23$, $p < .001$) and the transformed proportions ($Q = 774.74$, $df = 23$, $p < .001$). The estimated proportions of prior contact sex offenses ranged from a low of 9.2% for the fixed-effect analysis of proportions to 21.4% for the random-effects analysis of the proportions (see Table 3). Bourke and Hernandez (2009) was an outlier in the overall set of samples, although removing this sample had relatively little effect on the estimated proportions (e.g., a change from 21.4% to 17.8% for the random-effects model).

The proportion of prior contact offenses was significantly lower when the estimates were based on official reports (4.8% to 11.2%) than on self-report (51.4% to 60.0%). Arrests provided similar estimates (4.6% to 13.3%) to convictions (5.1% to 9.6%). The difference in the proportions using arrests versus convictions was statistically significant in the fixed-effect analysis ($\chi^2 = 18.7$, $df = 1$, $p < .001$), but not significant under the random-effects model ($\chi^2 = 0.291$, $df = 1$, $p = .590$).

Bourke and Hernandez (2009) was also identified as an outlier in the self-report data. Removing this study greatly improved the model fit: the Q value decreased from 147.7 to 23.7 for the raw proportions, and from 113.7 to 22.8 for the transformed proportions. Regardless of the analyses, and whether or not the outlier was excluded, approximately half of the online offenders admitted to prior contact offenses. Figure 2 presents the aggregate estimates of prior contact sex offenses.

Table 3. Meta-Analysis of the Proportion of Online Sexual Offenders with Previous Contact Sex Offenses

		Random		Fixed		Q	N	k
		Percentage	95% CI	Percentage	95% CI			
Overall	P	21.45	15.50-27.39	9.16	8.43-9.90	1,202.71**	4,697	24
	w/o B&H	17.80	13.64-21.95	7.88	7.14-8.63	518.78**	4,542	23
	Ä	19.56	13.35-26.63	15.52	14.50-16.57	774.74**	4,697	24
Official	P	10.93	7.85-14.02	4.83	4.23-5.44	421.34**	4,464	21
	Ä	9.80	6.97-13.06	11.23	10.32-12.17	249.29**	4,464	21
Arrests/ charges	P	12.16	7.31-17.00	4.64	3.82-5.45	300.36**	2,257	12
	Ä	10.48	6.04-15.98	13.33	11.96-14.76	170.91**	2,257	12
Convictions	P	9.56	5.22-13.91	5.07	4.18-5.96	120.49**	2,207	9
	Ä	8.95	5.92-12.52	9.25	8.08-10.49	59.73**	2,207	9
Self-report	P	51.38	29.66-73.10	59.96	56.25-63.67	147.66**	523	6
	w/o B&H	43.95	31.27-56.64	41.88	36.99-46.77	23.66**	368	5
	Ä	51.72	31.41-71.73	55.95	51.68-60.18	113.73**	523	6
	w/o B&H	44.21	32.69-56.06	42.46	37.46-47.54	22.75**	368	5

Note: P = raw proportions; w/o B&H = without Bourke and Hernandez (2009); Ä = arcsine transformed proportions; CI = confidence interval; k = number of studies.

* $p < .05$. ** $p < .001$.

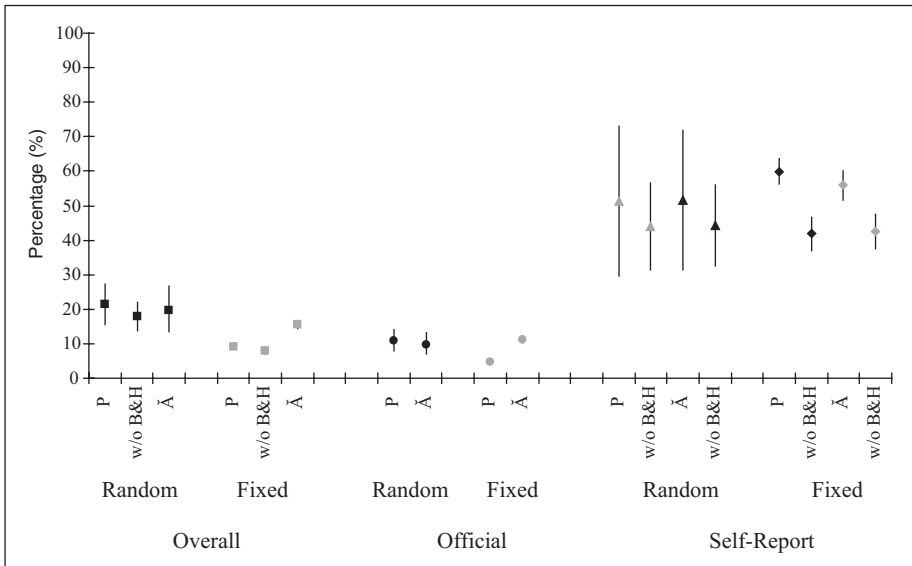


Figure 2. Percentages and confidence intervals of aggregated estimates of prior contact sex offenses: Random- and fixed-effect

Table 4. Meta-Analysis of the Recidivism Rates of Online Sexual Offenders

	Random		Fixed		Q	N	k
	Percentage	95% CI	Percentage	95% CI			
Sexual recidivism	2.80	1.17-5.08	3.93	3.22-4.71	78.25**	2,630	9
Contact sex offenses	0.72	0.04-2.19	1.38	0.81-2.11	36.11**	1,247	7
Child pornography	2.10	0.78-4.05	2.92	2.06-3.92	29.94**	1,247	7
Violent recidivism	1.96	0.24-5.30	3.36	2.32-4.58	36.04**	983	5

Note: Meta-analysis based on arcsine transformed (\hat{A}) proportions. CI = confidence interval; k = number of studies.

* $p < .05$. ** $p < .001$.

Recidivism

Of the total combined sample of 2,630 online offenders, 4.6% ($n = 121$) recidivated with a sexual offense after a 1.5- to 6-year follow-up; most of the follow-up times were less than 4 years. Information on type of sexual recidivism was available for 1,247 online offenders. Of these, 2.0% ($n = 25$) of the online offenders recidivated with a contact sexual offense and 3.4% ($n = 43$) recidivated with a child pornography offenses. Information on violent recidivism was available for 983 online offenders. Of these, 4.2% ($n = 41$) recidivated with a violent offense.

Fixed-effect meta-analysis found significantly more variability than would be expected by chance for all types of recidivism (see Table 4). No outliers were identified; the highest recidivism rates were observed in the recent study of two samples by Seto and Eke (Eke & Seto, 2008; Seto & Eke, 2008), who found total sexual recidivism rates of 8.0% and 10.3%, respectively. The remaining seven studies found sexual recidivism rates of less than 6%, with two studies reporting no sexual recidivists at all. The fixed-effect estimate for sexual recidivism was 3.9% and the random-effects estimate was 2.8%. The observed rates for the other types of recidivism were similarly low (0.7% to 3.4%).

Fixed-effect meta-regression found higher sexual recidivism rates in studies with longer average follow-up periods ($b = 0.0731$, $df = 1$, $Z = 4.44$, $p < .001$). Random-effects meta-regression found the same pattern ($b = 0.060$), but this result was not statistically significant ($Z = 1.38$, $p = .17$). Figure 3 presents the aggregated estimates of recidivism rates for online sexual offenders.

Discussion

In our first meta-analysis, we found that approximately 1 in 8 online offenders have a known contact sexual offense history at the time of their index offense, based on official records of arrests, charges, or convictions. The prevalence was higher when self-report information was used, with approximately half of the online offenders admitting to a contact sexual offense, consistent with the observation that official

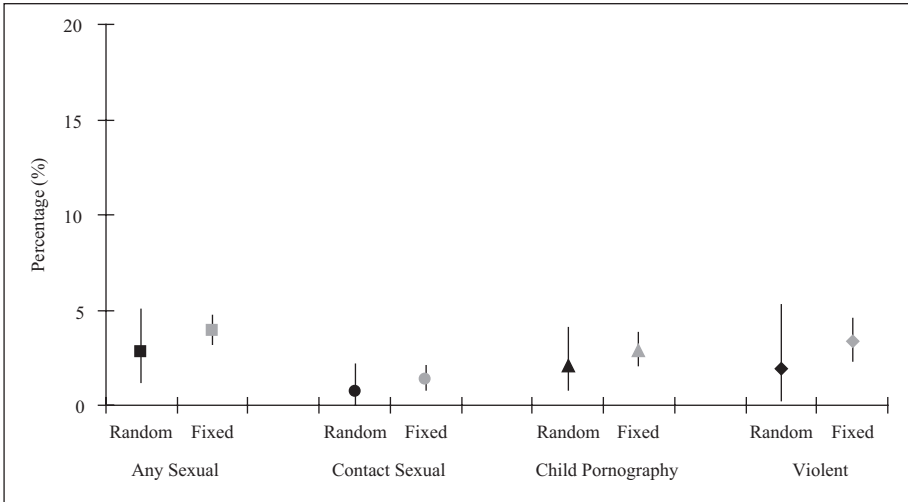


Figure 3. Percentages and confidence intervals of aggregated estimates of recidivism rates for online sexual offenders: Random- and fixed-effect

records are a conservative estimate of actual offending² (even if some of the self-reported offenses are false confessions and did not actually occur).

Although there is considerable overlap between online and offline offending, our results suggest there is a distinct group of online offenders whose only sexual crimes involve illegal (most often child) pornography or, less frequently, illegal solicitations of minors using the Internet. Knowing about criminal history, however, does not directly address the question of future risk to commit contact sexual offenses. After all, almost all of the sexual offenders followed in the studies reviewed by Hanson and his colleagues (Hanson & Bussière, 1998; Hanson & Morton-Bourgon, 2005) had committed contact sexual offenses, and the composite rate of detected sexual recidivism was 13% after an average of 5 to 6 years' follow-up. Longer-term follow-ups suggest approximately a third of sexual offenders with child victims will be detected for new sexual offenses after 20 to 30 years of opportunity (Hanson, Steffy, & Gauthier, 1993). Though other offenders in these follow-up studies will have committed offenses that were not officially detected, these data are not consistent with the idea that committing a contact sexual offense means that the offender will do it again.

Our second meta-analysis found that online offenders rarely go on to commit detected contact sexual offenses. During the follow-up period (up to 6 years), less than 5% of the online offenders were caught for a new sexual or violent offense. Two studies found no sexual recidivists.

The observed rates will increase with longer follow-up periods and not all new offenses are detected. Nevertheless, these rates are substantially lower than the recidivism rates of typical groups of offline sexual offenders. It is quite possible, however, that some online sexual offenders have relatively high recidivism rates. Eke and Seto

(2008) found that those online offenders who already had a history of offline offenders showed sexual recidivism rates higher than the expected base rates for typical sexual offenders (A. J. R. Harris & Hanson, 2004). In contrast, the online offenders who had no history of contact offenses almost never committed contact sexual offenses, despite a comparably high likelihood that they were sexually interested in children (Babchishin et al., in press).

Risk Assessment

Considerable advances have been made in the evaluation of recidivism risk for contact sexual offenders. A substantial number of reliable risk factors have been identified (Hanson & Bussière, 1998; Hanson & Morton-Bourgon, 2005), and these risk factors have been combined into structured or actuarial risk assessment procedures that can make valid predictions about future offending (Hanson & Morton-Bourgon, 2009). The three major types of risk factors are sexual deviance (e.g., pedophilia, sexual sadism), antisocial orientation (e.g., psychopathy, antisocial attitudes, and beliefs), and intimacy deficits (e.g., poor social skills, emotional identification with children, loneliness). In general, risk factors for sexual offenders with child victims are the same as the risk factors for sexual offenders against adults. Notable exceptions are pedophilia and emotional identification with children, which are most relevant for sexual offenders with child victims (see Seto, 2008).

For online sexual offenders, research is needed to establish the extent to which the risk factors found for offline sexual offenders also apply. Some risk factors may not be relevant (e.g., the distinction between stranger and acquaintance victims), whereas other risk factors may be unique to online offending (e.g., whether child pornography content was organized or disorganized). Even if the same risk factors are relevant, it appears the recidivism rates for online offenders are lower than the base rates obtained for offline sexual offenders due to group differences on some risk factors (e.g., online offenders are less likely to have prior criminal histories).

The initial research evidence suggests that the same risk factors matter for online or offline sexual offending. Seto and Eke (2005) followed 201 adult male online offenders listed on a provincial sex offender registry and found that those who had any kind of prior criminal history, sexual or nonsexual, were more likely to offend in the future, including committing contact sexual offenses during the follow-up. Only one of the child pornography offenders with no prior contact sexual offense history committed such an offense during the 2.5-year follow-up. Seto and Eke (2008) reported on a sample of 301 child pornography offenders (79% overlap with Eke and Seto's sample) identified from a review of Canadian police case files and also found that criminal history as well as substance use problems predicted contact sexual offenses after the 3.5-year follow-up. Criminal history, substance use problems, and self-reported sexual interest in children predicted violent offending, which included both nonsexually violent as well as contact sexual offenses (with some of the nonsexually violent offenses likely to be sexually motivated; Rice et al., 2006).

Webb et al. (2007) found that the Stable-2000 (Hanson, Harris, Scott, & Helmus, 2007; A. J. R. Harris & Hanson, 2003), an actuarial measure of potentially changeable risk factors, significantly predicted probation failures and "risky sexual behavior" in a sample of online offenders. Risky sexual behavior was defined as new allegations of child pornography or contact sexual offending, as well as behaviors, such as increased use of the Internet or accessing adult pornography, that were deemed to be related to past online offending. None of the child pornography offenders committed another contact sexual offense during the short (18 months) follow-up period.

Faust et al. (2009) identified a number of predictors of sexual recidivism in a follow-up study of 870 child pornography offenders released between 2002 and 2005 (with 50 sexual rearrests during an average follow-up of 3.8 years). These variables included low education, a history of prior treatment for sexual offending, being single, and possessing sexual material depicting children in the 13- to 15-year age range. Interestingly, those offenders convicted of crimes involving non-Internet child pornography were higher risk for sexual rearrest than were the offenders whose sexual crimes were restricted to the Internet.

Wakeling, Howard, and Barnett (in press) examined the predictive accuracy of the Risk Matrix 2000, a structured risk assessment measure developed by Thornton et al. (2003), in a sample of 1,344 Internet sexual offenders in the United Kingdom. The study found that offenders in the "very high" category showed relatively high rates of sexual recidivism, but that there were few differences in the sexual recidivism rates of the other categories (overall area under the curve = .67). Even though the online offenders scored relatively high on the measure, the overall recidivism rate of the online offenders was lower than in the developmental samples of offline offenders. Readers should note, however, that the study examined a modified version of Risk Matrix 2000 that needed to be further modified because of large amounts of missing information in the data sets analyzed.

Overall, the available prediction studies suggest that risk factors identified for offline offenders will likely also be helpful for risk assessments with online sexual offenders. Some of the established risk scales, such as the Sex Offender Risk Appraisal Guide (Quinsey, Harris, Rice, & Cormier, 2006) can be directly applied to online sexual offenders and it is reasonable to expect that they will be able to reliably rank order online offenders according to their risk for violent recidivism. Other risk scales, such as the Static-99 (Hanson & Thornton, 2000) or Static-2002 (Hanson, Helmus, & Thornton, 2010) would need to be modified before being used with online offenders because the current coding rules preclude their use with this population. Nevertheless, actuarial risk scales of this type are likely to be effective, given that the items tap a common pool of risk factors (e.g., offender age, criminal history, sexual interest in children) and given evidence that these scales perform similarly across different types of sexual offenders (Barnett et al., in press; Bartosh, Garby, Lewis, & Gray, 2003; G. T. Harris et al., 2003). The probabilistic estimates associated with these scales might not generalize to samples of online sexual offenders, given the lower recidivism rates obtained in follow-up research and the presence of offenders who have no known history of contact sexual offending.

Studies with longer follow-up periods and larger samples will be needed to establish probabilistic estimates, and to determine if there are a sufficient number of unique features of this population to justify the creation of new actuarial scales. Given the evidence to date, we believe that evaluators could justifiably take a parsimonious position and assume that the major risk factors (sexual deviance, antisocial orientation, intimacy deficits) found for offline sexual offenders also apply to online offenders.

Limitations

It could be the case that undetected online offenders are less likely to have an official criminal history because having a known contact sexual offense history increases police scrutiny and the likelihood of being arrested for online offending. This would mean the estimates of contact sexual offense history we obtained are biased upward. At the same time, individuals who remain undetected for online sexual offenses may also be more successful at avoiding arrest for contact sexual offenses, which would mean the history estimates we obtained are biased downward. Further research using anonymous surveys of self-reported offending by undetected online offenders are needed to clarify the extent and direction of this selection bias. This is difficult research to conduct because of fears of discovery among undetected online offenders, and because of the self-report biases that anonymous surveys may bring, but it would shed valuable light on this issue (see Ray, Kimonis, & Donoghue, 2009).

The large majority of online sexual offenders are charged with crimes relating to possession, distribution, or production of child pornography. Thus, much of what we can conclude from these meta-analyses about online sexual offenders is more specifically about online child pornography offenders and may not be applicable to the subset of online offenders who use Internet technologies to solicit minors. Research by Wolak and her colleagues at the Crimes Against Children Research Center suggests that these so-called luring or traveler offenders and their offenses have more in common with statutory sexual offenders than with contact sexual offenders who engage in explicitly coercive or aggressive crimes (Wolak, Finkelhor, Mitchell, & Ybarra, 2008). All of the victims of luring offenses in their survey of law enforcement arrests were aged 12 years or older, many of the adolescents were aware that the adult offender was interested in them sexually, many were aware that the adult was much older than them, and many thought of themselves as being involved in a romantic or intimate relationship. Only a minority of cases involved explicit coercion (16%) or violence (5%). More research is needed on the risk to reoffend and intervention needs of both statutory and online luring offenders.

It is highly likely there is a selection effect for computer sophistication in studies of online offenders. Only a minority of online offenders who are detected by police use technological methods to hide their activities (e.g., file encryption, anonymous remailers; Malesky, 2002; Wolak et al., 2005), yet one could readily imagine that the most technologically sophisticated and careful child pornography users can escape police detection for years (see Jenkins, 2001). We do not know if computer knowledge is related to the likelihood of offline offending, either in the past or in the future.

Anonymous online surveys could shed light on the computer knowledge of undetected offenders (compared with samples of detected offenders) and on the factors that play a role in online offending among undetected offenders.

All of the recidivism follow-up studies we examined relied on official records, which our first meta-analysis (and many criminological studies as well) shows is an underestimate of total sexual offending. Consequently, our recidivism estimates are conservative. It is not clear what the correction factor should be, in this or in other sexual offender recidivism research.

Implications

Given that many online offenders are strongly aroused by child pornography (Seto et al., 2006), our results suggest that pedophilic interests do not necessarily result in contact sexual offenses against children. Many of the online offenders in our study are likely to be sexually interested in children, but only half are known to have acted on these sexual interests. Those individuals who act on their pedophilic interests are likely to have personality traits and life circumstances that facilitate antisocial behavior and criminality (see Seto, 2008). Further research is needed to articulate the risk factors for sexual offenders who are neither pedophilic nor particular antisocial (e.g., a significant portion of incest offenders).

The low recidivism rates of online offenders may be used by some readers to minimize the seriousness of the online crimes committed. We believe this would be a mistake. Child pornography is a serious crime because it contributes to the sexual exploitation of children by creating demand for content, it offends community standards and values, and it is viewed by many members of the public as a serious crime (Lam et al., 2010). It would also be a mistake to fail to differentiate online offenders by the risk they pose. Although the research on risk factors is limited, we believe that the risk factors for online offenders are likely to be the same risk factors found for offline offenders (i.e., sexual deviancy, antisocial orientation, and intimacy deficits). Until research suggests otherwise, we recommend that valid measures of these risk factors should be used by the police, courts, correctional systems, and clinicians to prioritize interventions for individuals involved in online sexual offenses.

Authors' Note

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Notes

1. We will use the terms *online offenders* and *online offending* to refer to sexual crimes that involve the use of Internet and related technologies. This would include possession or distribution of child pornography via the Internet, possession or distribution of other illegal pornography content, and use of the Internet to solicit minors for sexual purposes. Most online offender research has focused on child pornography offenders. We use the terms *offline offenders* and *offline offending* to refer to sexual offenses that occur in the real world and do not involve the Internet in a central way. For example, a man who committed contact sexual offenses against his 12-year-old niece would be considered an offline offender even if he sometimes used email to communicate with her (in addition to contacting her in person).
2. Official records are also incomplete. The follow-up study by Seto and Eke (2005) and the data reported by Eke and Seto (2008) used police occurrence reports in addition to a national database of criminal charges and convictions. These investigators found that some charges reported in police occurrence reports were not recorded on the national database, there was often a lag between charges being laid and then appearing in the national database, and offenses for which individuals later received a pardon might be removed from the database (Angela Eke, personal communication, February 10, 2010). The use of police occurrence reports in obtaining recidivism data may help explain why the Eke and Seto studies produced higher sexual recidivism rates than those obtained in other studies.

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